

REMARKS

Claims 1-20 are currently pending in the application. In the Office Action dated August 23, 2004 ("Office Action"), the Examiner pointed out that, under 37 CFR 1.78(a)(2) and (a)(5), a specific reference to any prior non-provisional application must include the relationship between the applications, indicated that Figure 3 should be designated by a "prior art" legend, rejected claims 1 and 15 under 35 U.S.C. §103(a) as being unpatentable over Kodama et al., U.S. Patent-Application Publication US2002/0138696A1 ("Kodama") in view of Bachmat, U.S. Patent No. 6,275,897B1 ("Bachmat"), and indicated conditional allowance of claims 2-14 and 16-20, objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form.

Applicants have amended the prior-application reference in the specification, above, and have amended Figure 3 to include the "prior art" legend, as required by the Examiner. Applicant's representative would like to thank the Examiner for the conditional allowance of claims 2-14 and 16-20. Applicant's representative respectfully traverses the 35 USC §103(a) rejections of claims 1 and 15. Applicant's representative defers rewriting claims 2-14 and 16-20 until the Examiner has had a chance to consider the traversal of the 35 U.S.C. §103(a) rejections, provided below.

Please consider claim 1 of the current application:

1. A data-consistent, distributed unified data set device group that stores a distributed unified data set, the distributed unified data set device group comprising:

 a first data storage component, within a first supervisor local data-storage device, that stores a first portion of the distributed unified data set, the first supervisor local data-storage device receiving WRITE requests directed to the first portion of the distributed unified data set from a host computer via a communications medium;

 a second data storage component, within a second subordinate local data-storage device, that stores a second portion of the distributed unified data, the second subordinate local data-storage device ; and

 a mirror unified data set that mirrors the distributed unified data set stored on one or more remote data-storage devices.

The first element in claim 1 is a “first data-storage component, within a first supervisor local data-storage device.” The second element is a “second data storage component, within a second subordinate local data storage device.” The third element in claim 1 is a “mirror unified data set that mirrors the distributed unified data set stored on one or more remote data-storage devices.” Thus, the distributed unified data set device group claimed in claim 1 is distributed across two different local data-storage devices and mirrored to one or more remote data-storage devices. Figure 7 of the current application illustrates an exemplary distributed unified data set device group as one example of a data-consistent, distributed unified data set device group claimed in claim 1. The unified data set is distributed among the first supervisor local data-storage device 604a and the second subordinate local data-storage device 604b. The distributed unified data set is mirrored to a remote data-storage device 608.

Please contrast claim 1 and Figure 7 of the current application to Figure 1 of Kodama, cited by the Examiner in the 35 U.S.C. §103(a) rejection of claim 1. In Figure 1, a number of server computers 12₂-12_m access a single data-storage device 14. The single data-storage device includes a disk controller 22 and a number of individual disks 20₁-20₃. As discussed in Kodama in Paragraph [0008], there is a one-to-one correspondence between disk storage units, referred to as “mirrored” disk units, and processors. When a processor writes data to, or reads data from, the data-storage device 14, the data is written to, or read from, the master disk 20₁, and demons within the data-storage device 14 are responsible for copying data to, or reading data from, the particular mirrored disk 20₂-20₃ assigned to the processor. Note that, in Figure 1, a single disk 20₁ within the data-storage device 14 is labeled the “master disk,” and the remaining local disks 20₂-20₃ within the data-storage device 14 are labeled “mirrored disks.”

As can be seen by contrasting Kodama’s system, shown in Figure 1, with the claimed data-consistent, distributed unified data set device group shown in Figure 7 of the current application, it is readily apparent that there is no unified data set in Kodama distributed among multiple data-storage devices, and mirrored to one or more remote data-storage devices. Instead, there is only a single data-storage device, 14, in Kodama’s

Figure 1. Even were one to attempt to read claim 1 onto Kodama's Figure 1, considering the local disks 20₁-20₃ in Kodama's data-storage system 14 to be data-storage devices, there is no two data-storage devices in Kodama that can be considered to be local and together containing a single unified data set, since each mirrored disk in Kodama is mapped to a single processor. More importantly, there is no unified data set distributed among two local devices, in Kodama's system, that is mirrored to a remote data-storage device, because no remote data-storage devices are shown in Figure 1. In fact, Figure 1 simply shows a single disk-array, data-storage device 14 with one master local disk and multiple mirrored local disks.

In the Office Action, the Examiner apparently considers the master disk 20₁ in Kodama's Figure 1 to be both a first data-storage component and a first supervisor local data-storage array, and considers the mirrored disk 20₂ in Kodama's Figure 1 to be both a second data-storage component and a second subordinate local data-storage array. However, claim 1 specifically claims data-storage components within local data-storage devices, in one embodiment, disks within disk arrays. Applicant's representative respectfully observes that two distinctly claimed components cannot be read onto a single, simple device of the cited reference. These components are distinctly claimed because they are, in fact, distinct elements. A data-storage component is distinct from the data-storage device in which it is included. Secondly, the Examiner appears to consider a unified data set stored on one device and mirrored to another device to be distributed over the devices. That is not the case. A mirror is a complete copy of a data set. However, a data set distributed over two devices, as claimed in claim 1, has a first portion of the data set stored on one device, and a second portion of the data set stored on the second device. The distributed data set is not mirrored, but distributed. That is why two different terms are used in claim 1. The term "distributed" indicates that a single data set is distributed across multiple devices. The term "mirror" indicates that an entire data set is copied to one or more mirror data devices. The terminology employed in the current specification and in claim 1 is the terminology conventionally employed by those skilled in the art of disk arrays and other data-storage devices that employ mirroring. In fact, as clear from the text of Kodama that describes Figure 1, data sets are neither distributed nor mirrored

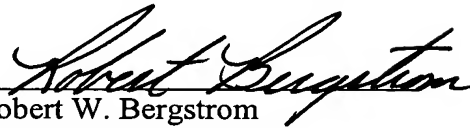
by Kodama. Instead, Kodama discloses a method by which individual disk units are assigned to individual processors in an allegedly efficient fashion.

Bachmat, in Figure 1 and in texts referring to Figure 1, discloses a technique for efficient data retrieval from a master mass-storage subsystem 12M that is mirrored to a slave mass-storage subsystem 12S. In this technique, cache memory of the slave mass-storage subsystem 12S is accessed prior to accessing the data-storage devices 22 of the master mass-storage subsystem 12M, when possible, for efficient retrieval. Claim 1 of the current application fails to read on Bachmat, just as claim 1 fails to read on Kodama. Claim 1 includes a unified data set distributed across two data-storage devices, that is mirrored to one or more remote data-storage devices. Bachmat, by contrast, discloses a first data-storage device 12M mirrored to a remote data-storage device 12S. There's no discussion in Bachmat of distribution of a unified data set across multiple data-storage devices.

Disk arrays are well known, and mirroring is well known. Distribution of a unified data set across multiple disk arrays is also well known. However, distribution of a unified data set across multiple local disk arrays, with mirroring to one or more remote disk arrays, in a data-consistent fashion, to which claim 1 is directed, is neither well known nor disclosed or suggested in Bachmat, Kodama, or a combination of Kodama and Bachmat. For this reason, Applicant's representative respectfully submits that neither Bachmat, Kodama, nor Bachmat and Kodama in combination teach, suggest, or mention a distributed unified data set distributed across multiple local disk arrays and mirrored to one or more remote disk arrays in a data-consistent fashion, as claimed in claim 1. Claim 15 includes language similar to that included in claim 1, and is also directed to distribution of a unified data set across multiple local disk arrays, with mirroring to one or more remote disk arrays, in a data-consistent fashion, that neither Bachmat, Kodama, nor Bachmat and Kodama in combination teach, suggest, or mention. In Applicant's representative's opinion, all of the claims remaining in the current application are clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

The application is now clearly in order for allowance.

Respectfully submitted,
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AMENDMENTS TO THE DRAWINGS

Figure 3 has been amended to designate by a legend identified as – Prior Art --